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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/527,761	03/17/2000	Brian C. Barker	BU9-99-157	3261

7590 01/30/2002

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EXAMINER
LEE, SEUNG H

ART UNIT	PAPER NUMBER
2876	

DATE MAILED: 01/30/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/527,761	Applicant(s) BARKER ET AL.	
	Examiner Seung H Lee	Art Unit 2876	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-54 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-54 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

1. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 2, 5, 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Re claim 2, line 2: "**sufficient contrast**" is indefinite and vague in its relationship to the contrast (i.e. what does it mean by reciting "sufficient contrast"?).

Re claim 5, line 2: "**sufficient depth**" is indefinite and vague in its relationship to the depth pits (i.e. what does it mean by reciting "sufficient depth"?).

Re claims 16, 25, and 26: "**about**" is indefinite and vague in its relationship to the depth pits and the length of pits (i.e., what does it mean by reciting "about 1mm" and "about 2mm"?).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1, 2, 5-11,13, 14, 16, 17, 20- 27, 29-32, 34, 37, 39, 40, 43-49, and 51-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan et al (US 4,585,931, cited by the applicant) in view of Iwai (US 4,418,467).

Duncan teaches a semiconductor wafer comprises a bar code identification (12) having a plurality of pits (13-18) on the front surface (31) in which has a first shape (i.e., long pits (16)) and a second shape (i.e., short pit (13)), the pits having a high contrast with surface, the barcode is readerable by reading device (38), the light striking the pits is reflected with a phase change (39', 39", and 39'"), the identification code on the back surface (see Fig. 1-3;col. 1, lines 41-64; col. 3, line 3-col. 6, line 41).

However, Duncan fails to teach or fairly suggest that the pits are readable before, during and after competition of processing on the wafer.

Iwai teaches the information mark (114) on the side surface (102) is readable before, during and after competition of processing on the wafer to the reader's eye, the information can be a letters or numerals (see col. 7, lines 21-24).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Iwai to the teachings of Duncan in order to improve the readability of the information mark during the processing of the wafer by designating the side surface of the wafer as marking surface. Moreover, such modification would provide an easier recognition of the information means the operator(s) can verify/acknowledge the information written with letter and/or numerals without using particular device to decode the information thereon the wafer. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Iwai to the teachings of Duncan, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233, and therefore an obvious expedient.

6. Claims 3, 4, 48, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan as modified by Iwai as applied to claim 1 above, and further in view of Moh et al (US 6,214,250) and Yano et al (US 6,268,641).

The teachings of Duncan/Iwai have been discussed above.

Although, Duncan/Iwai teach that the pits on the semiconductor wafer contrast with surrounding portion of wafer, they fail to teach or fairly suggest that the pits is provided by an ion implant.

However, Yano teaches the ion implant on the wafer and the pits previously forms are altered or invalidated (see Fig. 1-2 and 15-16; col. 1, lines 23-65; col. 6, lines 1-36), and Moh teaches the depths of pits are deeper than the top layer (16E) (see Fig. 5; col. 6, lines 1-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Yano and Moh to the teachings of Duncan/Iwai in order to provide an enhanced reading means by recognizing the pits with contrasting region around provided with the ion implant. Moreover, such modification would provide an improved reading-in of the reflected light source since the reflected lights from the ion implant have the different characteristics with comparing the light reflected from non-ion implant region, and therefore an obvious expedient.

7. Claims 12, 18, 19, and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan as modified by Iwai as applied to claim 1 above, and further in view of Young et al (US 5,792,566, cited by the applicant).

The teachings of Duncan/Iwai have been discussed above.

Although, Duncan/Iwai teach that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the pits is perpendicular to a top surface and a bottom surface of the wafer.

However, Young teaches the pit (172) is perpendicular to a top surface and a bottom surface of the wafer (see Fig. 1-3; col. 2, line 55- col. 4, line 3).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Young to the teachings of Duncan/Iwai in order to align/stack the wafers by matching the information mark or pits of wafers. Moreover, such modification would provide the faster processing means by aligning/stacking the wafers based on the pits provided thereon which is in the position for next processing steps, and therefore an obvious expedient.

8. Claims 15, 36, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan as modified by Iwai as applied to claim 1 above, and further in view of Yagi et al (US 5,324,609).

The teachings of Duncan/Iwai have been discussed above.

Although, Duncan/Iwai teach that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the pits is coated with silicon carbide.

However, Yagi teaches the coating of the surface of wafer with silicon carbide (see col. 5, line 51- col. 9, line 54).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings Yagi to the teachings of Duncan/Iwai in order to prevent/reduce the wear-off and tear-off of the surface of the wafer by coating the surface of the wafer. Moreover, such modification would provide the clear

reading of the pits since the coating of the wafer surface prevent dust materials from resting within the pits, and therefore an obvious expedient.

9. Claim 28 is rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan as modified by Iwai as applied to claim 1 above, and further in view of Mitsuda et al (US 5,481,095).

The teachings of Duncan/Iwai have been discussed above.

Although, Duncan/Iwai teach that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the light striking the pits form interference fringes.

However, Mitsuda teaches the interference fringes of reading process (see col.3, lines 52-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Mitsuda to the teachings of Duncan/Iwai in order to provide better readings of the information which encoded within the pits by forming the interference fringes thereon, and therefore an obvious expedient.

10. Claims 33, 35, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan as modified by Iwai as applied to claim 1 above, and further in view of Fujita et al (US 6,293,466).

The teachings of Duncan/Iwai have been discussed above.

Although, Duncan/Iwai teach that the pits on the semiconductor wafer, they fail to teach or fairly suggest that the pits have the same width and different lengths.

However, Fujita teaches the barcode with same width and different length (see Fig. 2; col. 3, lines 25-53).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the teachings of Fujita to the teachings of Duncan/Iwai in order to record more information with the code since the different length of the pit represent the different information, and therefore an obvious expedient.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure;

Poon et al [US 5,907,144] and Shahid [US 5,639,387] disclose a marking semiconductor surfaces.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Seung H. Lee whose telephone number is (703) 308-5894. The examiner can normally be reached on Monday to Friday from 7:30 AM to 4:00 PM.

If attempt to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Lee, can be reached on (703) 305-3503. The fax-phone number for this group is (703) 308-5841 or (703) 308-7722.

Communications via Internet e-mail regarding this application, other than those under 35 U.S.C. 132 or which otherwise require a signature, may be used by the applicant and should be addressed to [**michael.lee@uspto.gov**].

All Internet e-mail communications will be made of record in the application file. PTO employees do not engage in Internet communications where there exists a possibility that sensitive information could be identified or exchanged unless the record includes a properly signed express waiver of the confidentiality requirements of 35 U.S.C. 122. This is more clearly set forth in the Interim Internet Usage Policy published in the Official Gazette of the Patent and Trademark on February 25, 1997 at 1195 OG 89.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0956.

Seung H. Lee
Art Unit 2876
January 25, 2002

KARL D. FRECH
PRIMARY EXAMINER